

**ZMATH 2016f.00827**

**Wong, Terry Tin-Yau; Ho, Connie Suk-Han; Tang, Joey**

**The relation between ANS and symbolic arithmetic skills: the mediating role of number-numerosity mappings.**

Contemp. Educ. Psychol. 46, 208-217 (2016).

Summary: While recent meta-analyses have supported a positive relation between the Approximate Number System and math achievement, the mechanism of this relation remains unclear. In this study, we examined whether the precision of mapping between number symbols and our representation of numerosity accounts for the relation between the Approximate Number System and symbolic arithmetic skills. This precision of mapping was measured using numerical estimation tasks. A sample of 210 kindergarteners was tested on their Approximate Number System acuity. The subjects were tested two more times on their estimation skills and symbolic arithmetic skills when they were in Grade 1. Using the structural equation modelling, it was found that the number-numerosity mapping skills fully mediated the relation between the Approximate Number System and symbolic arithmetic skills in a longitudinal model. It is suggested that higher acuity of the Approximate Number System facilitates the number-numerosity mapping process, which, in turn, brings about better symbolic arithmetic skills. The present findings suggest that the Approximate Number System and number-numerosity mapping may be some of the key domain-specific skills in mathematics learning.

*Classification:* F21 F22 F31 F32 C31 C32

*Keywords:* mathematical cognition; approximate number system; number-numerosity mapping

doi:10.1016/j.cedpsych.2016.06.003